

DOCKET NO.: CC-3184

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **Brian Fields**

Confirmation No.: **9252**

Serial No.: **09/857,145**

Group Art Unit: **3781**

Filing Date: **May 31, 2001**

Examiner: **MAI, TRI M**

For: **SMALL DIAMETER CAN END WITH LARGE OPENING**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPELLANT'S BRIEF PURSUANT TO 37 C.F.R. § 41.37

This brief is being filed in support of Appellant's appeal from the rejections of claims 1-10 in the Final Office Action dated March 17, 2008 (FR). A Notice of Appeal was filed on August 18, 2008. An extension of time for five months is filed concurrently. Thus, this brief is timely.

(1) REAL PARTY IN INTEREST

The real party in interest is Crown Cork & Seal Technologies Corporation, the assignee of the entire interest.

(2) RELATED APPEALS AND INTERFERENCES

None.

(3) STATUS OF CLAIMS

The status of the claims is as follows:

Claims rejected: Claims 1-10

Claims allowed: none

Claims withdrawn: none

Claims objected to: none

Claims cancelled: none

Claims appealed: Claims 1-10

(4) STATUS OF AMENDMENTS

No amendment to the claims has been submitted since the Final Office Action dated March 17, 2008.

(5) SUMMARY OF THE CLAIMED SUBJECT MATTER

The following summary is for the purpose of complying with the provisions of 37 CFR 41.37(c)(1)(v). The entire disclosure should be reviewed to obtain a complete understanding of the claim language. Citations to the specification is by page and line numbers, e.g., "Page 1, lines 1-10" and citations to the figures is by figure number, e.g., "[Fig. 1, reference numeral 100]."

Claim 1	
Claim Language	Citation To Specification And Drawings For Structure Corresponding To The Function
1. An easy open can end having improved flow characteristics, said end comprising:	Page 1, lines 1-6; and Fig. 1, reference numeral 1, for example
a circular center panel with a rupturable score line therein, the score line defining the periphery of a non-removable tear panel,	Page 6, lines 4-11; and Fig. 1, reference numerals 3 and 10, for example
a non-detachable tab including a nose portion and a rear portion; and	Page 6, lines 11-18; and Fig. 1, reference number 20, for example
a connection between the tab and the center panel which acts as a pivot about which the tab can be rotated out of the plane of the center panel, such that in use, the rear portion of the tab is lifted to cause the nose portion of the tab to press down on the tear panel, thereby rupturing the score line and swinging the tear panel out of the plane of the center panel to create an opening,	Page 6, lines 21-31; and Page 7, lines 1-2, for example

the opening including a major axis and a minor axis, the minor axis located at a diameter of the center panel and the major axis located perpendicular to said diameter, the diameter of the center panel is less than 1.835 inches (46.6 mm) and the opening has an area of less than 0.5 square inches (323 mm ²) and an aspect ratio of between about 1.5 and 1.7.	Page 7, lines 7-22; and Fig. 1, for example
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(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- (1) Independent claim 1 and its dependent claims 2-10 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,711,448 ("Clarke").
- (2) Independent claim 1 and its dependent claims 2-10 have also been rejected under 35 U.S.C. § 103 as being unpatentable over Clarke in view of WO9637414 ("Carnaudmetalbox"), and further in view of either EP432659 ("Schmalbach") or the admitted prior art.
- (3) Independent claim 1 and its dependent claims 2-10 have also been rejected under 35 U.S.C. § 103 as being unpatentable over either Schmalbach or the admitted prior art in view of Clarke, and further in view of Carnaudmetalbox.

(7) ARGUMENT

(I) Rejection of claims 1-10 under 35 U.S.C. § 102(b) based on Clarke

a. Legal Standard

Anticipation is an exacting standard. Under 35 U.S.C. § 102, every limitation of a claim must identically appear in a single prior art reference for it to anticipate the claim. *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990). In addition, "[e]very element of the claimed invention must be literally present, arranged as in the claim." *Richardson v. Suzuki Motor Co., Ltd.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989)

b. Analysis

Independent claim 1 recites in part, an easy open can end having, *inter alia*, the following three limitations, each recited in claim 1:

- (i) "the diameter of the center panel is less than 1.835 inches (46.6 mm),
- (ii) the opening has an area of less than 0.5 square inches (323 mm²) and
- (iii) [the opening has] an aspect ratio of between about 1.5 and 1.7".

As admitted by the examiner elsewhere in FR and as explained below, Clarke discloses neither the claimed center panel diameter nor the claimed aspect ratio.

Regarding the center panel diameter limitation, while Clarke states that its teaching may be applied to can ends “within the range of 200 – 300 diameters” (that is, a range of diameters $2\ 0/16^{\text{ths}}$ to $3\ 0/16^{\text{ths}}$ inches)(Clarke, column 6, line 66 – column 7, line 1), it is silent on the diameter of its *center panel*. The examiner has not, and can not, point to any disclosure of Clarke that expressly describes its center panel as having a diameter that is less than 1.835 inches, as required by claim 1. The examiner even admits Clarke’s failure to disclose the claimed center panel diameter later in FR in the paragraph setting forth the obviousness rejection based upon Clarke, stating, “Clarke meets all claimed limitations *except for the diameter of the center panel being less than 1.835 inches . . .*” (FR at page 2, paragraph 2) (emphasis added).

Regarding the aspect ratio limitation, the examiner expressly admits that Clarke does not disclose applicant’s claimed aspect ratio, stating that “*Clarke[] does not mention the ratio aspect [sic] between 1.3 and 1.7.*” As an initial matter, this misstates the claimed range of “an aspect ratio of between about 1.5 and 1.7.” The examiner then states that “it is recognized in the art that the LOE openings generally has an aspect ratio of 1.49” (FR at page 2, paragraph 1), apparently relying either on inherency or prior art without citation. Either way, not only has the examiner made a conclusory argument without providing support.

Further, it is improper under 35 U.S.C. § 102 for the examiner to rely merely upon “prior art cited” as describing a claimed feature and then conclude based upon unnamed prior art that the alleged feature is inherently present in Clarke. It is well settled that inherency cannot be established by possibilities and probabilities. *In re Robertson*, 49 USPQ 1949, 1951 (Fed Cir. 1999). The examiner’s admission that Clarke does not describe several of the claimed features of claim 1 mandates reversal of the rejection.

Because every limitation of independent claim 1 is not disclosed by Clarke, reversal of the rejection is courteously solicited.

(II) Rejection of claims 1-10 under 35 U.S.C. § 103(a) based on Clarke in view of Carnaudmetalbox and further in view of Schmalbach or the admitted prior art.

a. Legal Standard

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See *In re Fine*, 837

F.2d 1071, 1073 (Fed. Cir. 1988). A claim is obvious only when the subject matter of the claim as a whole would have been obvious to a person having ordinary skill in the art. 35 U.S.C. § 103(a). As set forth in *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007):

[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.

In determining the obviousness of a patent claim, the examiner is expected to make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966). For example, the examiner must take into account, when present, any objective evidence of non-obviousness, such as criticality or unexpected results. While, any difference between the claimed invention and the prior art may be expected to result in some differences in properties, the issue is whether the properties differ to such an extent that the difference is really unexpected. *In re Merck & Co.*, 800 F.2d 1091 (Fed. Cir. 1986). These showings by the examiner are an essential part of complying with the burden of presenting a *prima facie* case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the *prima facie* case with argument and/or evidence. For example, evidence of unexpected advantageous properties, such as superiority in a property the claimed invention shares with the prior art, can rebut *prima facie* obviousness. *In re Chupp*, 816 F.2d 643, 646 (Fed. Cir. 1987)(stating that “[e]vidence that a compound is unexpectedly superior in one of a spectrum of common properties . . . can be enough to rebut a *prima facie* case of obviousness.”). Obviousness is then determined on the basis of the evidence as a whole. See *id.*; *In re Hedges*, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and *In re Rinehart*, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

b. Analysis

Independent claim 1 recites in part, an easy open can end having, *inter alia*, the following three limitations, each recited in claim 1:

- (i) “the diameter of the center panel is less than 1.835 inches (46.6 mm),
- (ii) the opening has an area of less than 0.5 square inches (323 mm²) and

(iii) [the opening has] an aspect ratio of between about 1.5 and 1.7”.

- i. **The examiner has not established a prima facie case of obviousness because Clarke in view of Carnaud metalbox, Schmalbach, and the admitted prior art does not teach or suggest each and every feature of applicant’s claimed can end.**

First, this rejection under Section 103 is based on Clarke’s purported disclosure of a can end having an opening area of less than 0.5 square inches. But Clarke, taken as a whole, should be construed to teach away from this limitation.

As an initial matter, even though the FR does not cite to this particular part of Clarke, Clarke states that “the area of the standard opening is in the range of 0.42 – 0.475 square inch. Although not strictly necessary, the invention as described above is suitable for use in can ends having the aforementioned conventional sized standard opening areas.” (Clarke, column 7, lines 1-5). Read as a whole, however, it is clear that Clarke teaches away from employing the standard size opening by, for example expressly stating that it is an “*object [] to facilitate the use of larger size openings*” (Clarke, column 2, lines 33-35 & 9-14) (italics added) and that a “‘larger opening’ is . . . in the range of approximately 0.5 to 0.75 square inch”:

As used in this specification, a “larger opening” is an opening area defined by the tear panel in the range of approximately 0.5-0.75 square inch, which has been found desirable in can ends having a diameter in the range of about 202-211, . . .
(Clarke, column 2, lines 9-14).

Even Clarke’s stated problems (non-turnunder and insufficient angle of the tear panel upon opening) would lead a person of ordinary skill in the art to understand that the disclosure is directed to ends having an opening larger than 0.5 square inches, as Clarke explains that these “problems become exacerbated as larger openings are formed within can ends for either aesthetic reasons or to ensure greater pourability and drinkability.” (Clarke, column 2, lines 6-9). Moreover, Clarke’s title is “Non-Detachable Tab Can End With *Large Oval Opening*” (italics added) and its abstract states, “[t]he area of the tear panel is *at least 0.50 in²*.” (italics added).

Further, neither Clarke nor the other cited references appear to appreciate the “improved flow characteristics,” that are recited in applicant’s preamble. Other than Clarke’s statement that openings larger than 0.5 in² “are formed within can ends for either aesthetic reasons or to ensure greater pourability and drinkability” (Clarke, col. 2, lines 6-9), Clarke is silent on pouring characteristics of openings. Clarke, in fact, is directed not to flow

characteristics of the opening at all, but rather is directed to the mechanical aspects of opening the tear panel of a larger diameter end. For example, the stated problems of non-turnunder and insufficient opening are mechanical and each “object of the present invention” relates to successfully rupturing and propagating the opening around the score. (See Clarke, column 1, line 49 – column 2, line 35).

Thus, considering Clarke’s silence on the flow characteristics of its opening and its express focus on mechanical opening properties of the tear panel for ends larger than 0.5 in² opening area, a person considering designing smaller ends and optimizing flow characteristics of smaller ends having an opening area less than 0.5 in² would not look to Clarke. Notwithstanding general statements relating to its opening’s suitability to other sizes, and considering the reference as a whole, Clarke, in fact, teaches away from reducing the opening size below 0.5 in².

Second, the examiner incorrectly asserts that Schmalbach discloses the claimed aspect ratio of 1.5 to 1.7. Rather than disclosing an aspect ratio in the claimed range, Schmalbach, which was published in German, in its English-language Abstract and claims is silent regarding the aspect ratio. Based on Schmalbach’s silence regarding the aspect ratio, the examiner apparently, but inappropriately, relies on measurements or proportions from the figures of Schmalbach to determine the aspect ratio. (FR, page 2). As discussed in *Hockerson-Halbertstadt, Inc. v. Avia Group Int’l*, 222 F.3d 951, 956 (Fed. Cir. 2000) in considering a similar issue regarding patent drawings:

HHI's argument is unavailing. The '792 *patent* is devoid of any indication that the proportions of the groove and fins are drawn to scale. HHI's argument thus hinges on an inference drawn from certain figures about the quantitative relationship between the respective widths of the groove and fins. Under our precedent, however, it is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue. See *In re Wright*, 569 F.2d 1124, 1127, 193 U.S.P.Q. 332, 335 (CCPA 1977) ("Absent any written description in the specification of quantitative values, arguments based on measurement of a drawing are of little value."); *In re Olson*, 41 C.C.P.A. 871, 212 F.2d 590, 592, 101 U.S.P.Q. 401, 402 (CCPA 1954); cf. *Manual of Patent Examining Procedure* § 2125 (1998).

See also *In re Wilson*, 312 F.2d 449, 454 (CCPA 1963) (“Patent drawings are not working drawings...”). As there is nothing in Schmalbach that indicates that its figures are drawn to scale, Schmalbach must be considered to teach or suggest nothing relating to the proportions of its figures, and therefore nothing relating to the aspect ratio of its opening. Accordingly, it

is not appropriate to use Schmalbach for disclosure of applicant's claimed aspect ratio, nor as either a primary reference or secondary reference on which to base a rejection.

Third, the FR also states that applicant's specification refers to a conventional end having an aspect ratio of 1.47, but that end not only has an opening area of 0.596 in² - that is, much larger than applicant's claimed area limitation - but also has a center panel greater than 1.835 inches. As explained above with respect to the Clarke reference, the prior art teaches away from reducing the opening size to below 0.5 in². A single data point - showing only an aspect ratio near but not within the claimed range but having both an opening area outside of the claimed range and a panel diameter outside the claimed range - does not provide a motivation to combine, especially considering Clarke's teaching away from reducing the opening area.

Moreover, as explained in the Declaration of Brian Fields filed December 09, 2002, prior to applicant's discovery and invention, the conventional thinking at the time the invention was made led away from employing the claimed aspect ratio range and toward a substantially circular geometric shape. As explained in Paragraph 5 of Mr. Fields Declaration, a geometric shape approaching a circle was considered to provide the best combination of open area and good flow parameters. Further, a slot shape was generally considered to be not preferred because of the inherent difficulties in drinking from a slot shaped opening- including the fact that the pursed lips of some drinkers may not be wide enough to fully cover the slot, which could result in dribbling. Thus the conventional thinking led away from an aspect ratio greater than the claimed ratio of about 1.5.

Finally, the examiner states that "[e]ven to the degree it is argued that the flow rate is not being taught by the applied references, . . . the patentability of a product does not depend on its method design of such product. If the product [] is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different design process." (FR, page 3). It is unclear what this refers to, but if it is an attempt to negate the claimed "improved flow characteristics," the examiner's position is not apt. The function of improved flow characteristics is a result of, and connotes, structure and has nothing to do with the "design process" of making the end.

Considering that Clarke provides no teaching relating to pour characteristics and generally guides toward employing an opening larger than 0.5 in², that Schmalbach provides no evidence relating to an aspect ratio, that the admitted prior art provides an aspect ratio that falls outside of the claimed range and that the conventional thinking at the time of applicant's invention taught away from employing the claimed aspect ratio, applicant submits that the art

taken as a whole teaches away from the claimed combination and that a prima facie case has not been made by the examiner.

ii. The examiner has not established a prima facie case of obviousness because Schmalbach or the admitted prior art in view of Clarke, and Carnaudmetalbox does not teach or suggest each and every feature of applicant's claimed can end.

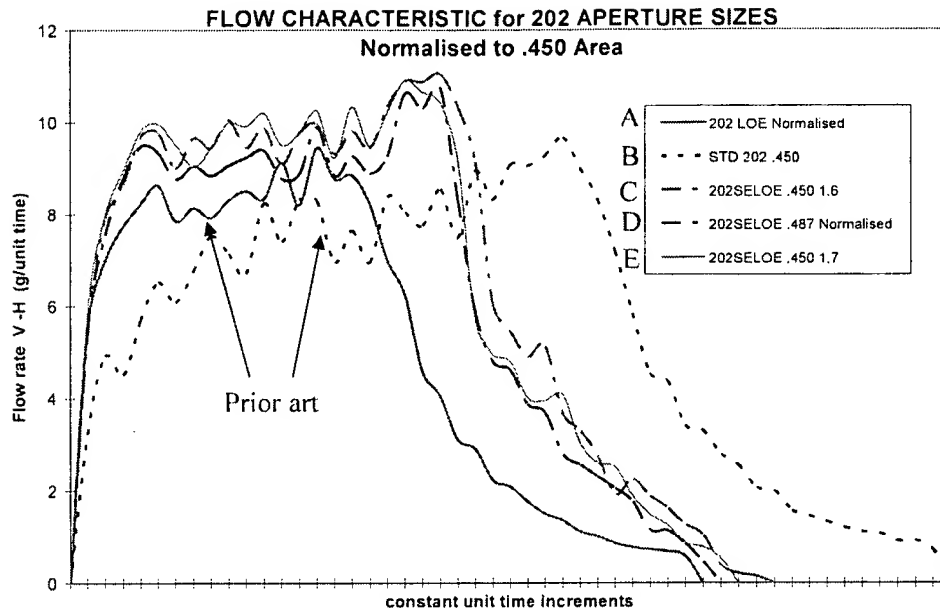
As explained above, Schmalbach fails to disclose the only limitation at issue (that is, the aspect ratio) for which it is cited. Further, the admitted prior art teaches only the aspect ratio of 1.47, and each of its opening area and center panel diameter are outside of the claimed ranges. Again as explained above, Clarke is directed to employing an opening *larger* than the claimed opening which has an area of less than 0.5 square inches, and therefore teaches away from modifying the admitted prior art's disclosed opening area of 0.596 square inches. Mr. Fields aptly explained that the trend, consistent with the teaching of Clarke, was toward larger openings. There plainly is nothing to teach or suggest, and very much to oppose, modifying the admitted prior art as suggested by the examiner.

iii. Not only has the examiner failed to establish a prima facie case of obviousness, but the examiner has also failed to appreciate the unexpectedly beneficial flow characteristics of applicant's end.

The examiner has failed to appreciate the significant difference in flow characteristics between applicants claimed end and prior art ends, which difference constitutes unexpected results. Simply put, the claimed combination, unexpectedly, provides for a higher inrush and lower magnitude of unsteady-state flow (glugs) per unit area upon pouring from a can. The examiner never appreciated the unpredictable nature of unsteady flow.

As explained in the Declaration of Mr. Brian Fields filed September 19, 2005, a large-magnitude peak of normalized flow rate (or flow rate per unit area), "an important parameter in evaluating end performance," generally corresponds to a beneficial inrush characteristic (Fields Declaration, ¶ 6). And the high initial peak values of the inventive, claimed ends C, D, and E (compared to conventional ends A and B) demonstrate that applicant's solution achieves the result of enhancing flow characteristics through a relatively small opening. (Fields Declaration, ¶ 7).

A summary of relevant attributes of the tested ends of graph 1 is provided below:



Label for Prior Art Ends	Color	Area (sq. in.)	Aspect Ratio
A – 202 LOE Normalized	pink (thick)	0.596	1.47
B – Std 202 .450	black	0.487	1.1

Label for Inventive Ends	Color	Area (sq. in.)	Aspect Ratio
C – 202 SE LOE .450 1.6	red	0.450	1.61
D – 202 SE LOE .487 Normalized	blue	0.487	1.51
E – 202 SE LOE .450 1.7	pink (thin)	0.450	1.7

Applicant's can end clearly has superior flow characteristics compared to the prior art can ends, which as explained by Mr. Fields constitute unexpected results. The only art cited against applicant's claimed can end that teaches a specific aspect ratio is the admitted prior art, and as shown in the graph, the admitted prior has inferior flow characteristics as compared to applicant's claimed end.

The examiner counters and states that "the examiner doesn't see any unexpected results coming from the test results as shown in Fig. 3, note that the flow rate indicative of B is nothing more than a normal deviation as compared from the two prior art curves." (FR, page 4). The examiner, however, possibly misconstrues a prior art plot as that of applicant's inventive end even though plot B is clearly labeled prior art, or perhaps the examiner is confusing applicant's evidence of unexpected results with data from the as-filed application.

Regardless of the misinterpretation or under-appreciation of the unpredictability of non-steady state flow, each one of the three plots of applicant's inventive end is clearly above and generally spaced apart from the plots of the prior art ends, and also reflect local peaks of lower magnitude than those of the prior art ends in other words, reflecting superior characteristics.

All can ends have a certain flow characteristic and because applicant has provided evidence which shows superiority in a property the claimed can end shares with the prior art, applicant submits that the examiner has committed legal and factual error in not appreciating the improved flow characteristics of applicant's claimed can end. Accordingly, applicant requests withdrawal of the rejection.

In summary, as explained in *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992) (citations omitted):

[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability. If that burden is met, the burden of coming forward with evidence or argument shifts to the applicant.

After evidence or argument is submitted by the applicant in response, patentability is determined on the totality of the record, by a preponderance of evidence with due consideration to persuasiveness of argument.

Here, applicant has established that the examiner has not established a *prima facie* case of obviousness. In any event, applicant has supplied rebuttal evidence and when the totality of the record and the relative persuasiveness of the arguments is considered, the only reasonable conclusion to reach is that claims 1-10 are not obvious under 35 U.S.C. § 103(a).

(8) CONCLUSION

Independent claim 1 is patentable for two reasons. First, no combination of Clarke, Carnaudmetalbox, Schmalbach and the admitted prior art teaches or suggests all of the elements of claim 1. Second, secondary considerations of superiority in a shared property of the claimed can end over prior art ends demonstrates that the modification suggested in the pending Office Action is not obvious. Applicant submits that claim 1 and its dependent claims are in condition for allowance. For the reasons set forth in the Appeal Brief, it is urged that the Office's rejection is in error and should be reversed.

Respectfully submitted,

/ Harold H. Fullmer /

Date: March 13, 2009

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CLAIMS APPENDIX

1. (Previously presented) An easy open can end having improved flow characteristics, said end comprising:
 - a circular center panel with a rupturable score line therein, the score line defining the periphery of a non-removable tear panel.
 - a non-detachable tab including a nose portion and a rear portion; and
 - a connection between the tab and the center panel which acts as a pivot about which the tab can be rotated out of the plane of the center panel, such that in use, the rear portion of the tab is lifted to cause the nose portion of the tab to press down on the tear panel, thereby rupturing the score line and swinging the tear panel out of the plane of the center panel to create an opening, the opening including a major axis and a minor axis, the minor axis located at a diameter of the center panel and the major axis located perpendicular to said diameter, the diameter of the center panel is less than 1.835 inches (46.6 mm) and the opening has an area of less than 0.5 square inches (323 mm²) and an aspect ratio of between about 1.5 and 1.7.
2. (Original) An easy open can end according to claim 1, wherein the opening is elliptical.
3. (Previously presented) An easy open can end according to claim 1, wherein the aspect ratio of the opening is about 1.5.
4. (Previously presented) An easy open can end according to claim 1, wherein the centre panel lies below the level of the outer circumference of the end and the side wall, between the centre panel and said outer circumference, is inclined at an angle of between 20° and 60° to the plane of the end panel.
5. (Previously presented) An easy open can end according to claim 1, wherein the tear panel further comprises a bead which substantially follows the periphery of the score and the nose portion of the tab.
6. (Original) An easy open end according to claim 5, wherein the bead on the tear panel is closed.

7. (Previously presented) An easy open end according to claim 1, wherein said end exhibits a higher first peak of flow rate per unit opening area compared with the first peak of flow rate per unit opening area of an end having an aspect ratio of 1.47 and an opening area of 0.596 square inches and compared with the first peak of flow rate per unit opening area of an end having an aspect ratio of 1.1 and an opening area of 0.450 square inches.
8. (Previously presented) An easy open end according to claim 1, wherein said end exhibits a higher first peak of flow rate per unit opening area compared with the first peak of flow rate per unit opening area than an end having an aspect ratio between 1.3 and 1.7 and an opening area of greater than 0.5 square inches.
9. (Previously presented) An easy open end according to claim 8, wherein said end exhibits a higher first peak of flow rate per unit opening area compared with the first peak of flow rate per unit opening area than an end having an aspect ratio between about 1.5 and 1.7 and an opening area of greater than 0.5 square inches.
10. (Previously presented) An easy open end according to claim 9, wherein said end exhibits a higher first peak of flow rate per unit opening area compared with the first peak of flow rate per unit opening area than an end having only one of an aspect ratio about 1.5 and an opening area of greater than 0.5 square inches.

EVIDENCE APPENDIX

CC-3184;WO110US

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Fields, Brian

Serial No.:	09/857,145	Group Art Unit:	3727
Filed:	May 31, 2001	Examiner:	Mal, Tri M.

For: SMALL DIAMETER CAN END WITH LARGE OPENING

Assistant Commissioner for Patents
Washington, D.C. 20231

DECLARATION OF MR. BRIAN FIELDS

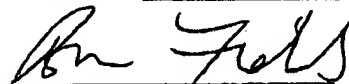
I, Mr. Brian Fields, make the following declaration:

1. I, Brian Fields, am the inventor of the subject matter disclosed and claimed in United States Patent Application No. 09/857,145 ("Patent Application"). I understand that the pending claims of the Patent Application have been rejected by the patent office based on a combination of references.
2. I am employed by Crown Technologies Corporation, where my present capacity is End Development Manager. I have a bachelors degree in Mechanical Engineering from Loughborough University, U.K., and have been involved in engineering and development in the field of metal containers for 24 years.
3. I performed the testing reflected in the graph included in the as-filed application (for ends A -C) and the graph included in the prior response submitted to the patent office on December 9, 2002 (for end D).

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PATENT

4. I prepared the enclosed graph by forming a can end having an opening area of 0.450 square inches and an aspect ratio of 1.7 and measuring the flow rate according to the same test procedures that I used to produce the plots for ends A - D. I then added the data for end E to the normalized graph of ends A - D.
5. The shape of the plots of normalized flow rate on the y-axis versus unit time on the x-axis, ignoring dimensions, generally represents flow rate per unit area versus unit time.
6. Flow characteristics upon initially rotating a container (as described on page 2, line 22, et seq., of the as-filed application) are important parameters in evaluating end performance. I believe the first peak of a graph of flow rate versus unit time is an important parameter that reflects inrush characteristics. The normalized first peak, as described above, represents the inrush characteristic per unit area, and is an important parameter in evaluating end performance.
7. The normalized graph shows the magnitudes of the first peaks in flow rate per unit area of the inventive openings C, D, and E are significantly greater than those of conventional ends A & B. The greater magnitudes of the first peak of flow rate per unit area of the inventive ends represent unexpected results.
8. All statements of my own knowledge are true and correct, or are based on information that I believe to be true and correct. I acknowledge that willful false statements and the like are punishable by fine or imprisonment, or both, and may jeopardize the validity of the application or any patent issuing thereon.

Executed on Sept 19th 2005

Brian Fields

CC-3184; WO1,101US

PATENT



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In application of:

Fields, Brian

Serial No.: 09/857,145

Group Art Unit: 3727

Filed: May 31, 2001

Examiner: Mai, Tri M.

For: SMALL DIAMETER CAN END WITH LARGE OPENING

Assistant Commissioner for Patents
Washington, D.C. 20231RECEIVED
MAY 24 2004
TECHNOLOGY CENTER 3700

DECLARATION OF MR. BRIAN FIELDS

I, Mr. Brian Fields, make the following declaration:

1. I, Brian Fields, am the inventor of the subject matter disclosed and claimed in United States Patent Application No. 09/857,145 ("Patent Application"). I understand that the pending claims of the Patent Application have been rejected by the patent office based on a combination of references.
2. I am employed by Crown Technologies Corporation, where my present capacity is End Development Manager. I have a bachelors degree in Mechanical Engineering from Loughborough University, U.K., and have been involved in engineering and development in the field of metal containers for 23 years.
3. I performed the testing reflected in the graph included in the as-filed application and the graph included in the prior response submitted to the patent office on December 9, 2002 as Exhibit I.

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4. I prepared the enclosed plots by dividing the flow rate data of Exhibit 1 (of the December 9, 2002 response) by the ratio of the opening area of the base end (that is, 0.450 sq. in.) to the opening area of the particular end to produce data that is normalized by area. For example, each of the y-axis magnitudes (using the scale on the left side of the graph) for the end of Plot D having an opening area of 0.487 sq. in. is multiplied 0.924 (that is, $0.450/0.487$). The scale on the right side of the graph shows the data of Exhibit 1 divided by the opening area of the particular end to produce y-axis magnitudes of flow rate per unit area. For example, each of the y-axis magnitudes (using the scale on the right side of the graph) for the end of plot D having an opening area of 0.487 sq. in. is divided by 0.487 sq. in.
5. The shape of the plots of normalized flow rate on the y-axis versus unit time on the x-axis, ignoring dimensions, generally represents flow rate per unit area versus unit time.
6. Flow characteristics upon initially rotating a container (as described on page 2, line 22, et seq., of the as-filed application) are important parameters in evaluating end performance. I believe the first peak of a graph of flow rate versus unit time is an important parameter that reflects inrush characteristics. The normalized first peak, as described above, represents the inrush characteristic per unit area, and is an important parameter in evaluating end performance.
7. The normalized graph shows the magnitudes of the first peaks in flow rate per unit area of the inventive openings C and D are significantly greater than those of conventional ends A & B. The greater magnitudes of the first peak of flow rate per unit area of the inventive ends represent unexpected results.
8. All statements of my own knowledge are true and correct, or are based on information that I believe to be true and correct. I acknowledge that willful false statements and the like are punishable by fine or imprisonment, or both, and may jeopardize the validity of the application or any patent issuing thereon.

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Executed on 18th MAY 2004

Brian Fields
Brian Fields

CC-3184;WO110US



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#9
H. Colby
12/18/02

In re application of:

Fields, Brian

Serial No.: 09/857,145

Group Art Unit: 3727

Filed: May 31, 2001

Examiner: Mai, Tri M.

For: SMALL DIAMETER CAN END WITH LARGE OPENING

Assistant Commissioner for Patents
Washington, D.C. 20231

DECLARATION OF MR. BRIAN FIELDS

I, Mr. Brian Fields, make the following declaration:

1. I, Brian Fields, am the inventor of the subject matter disclosed and claimed in United States Patent Application No. 09/857,145 ("Patent Application"). I understand that the pending claims of the Patent Application have been rejected by the patent office based on a combination of references.
2. I am employed by Crown Technologies Corporation, where my present capacity is End Development Manager. I have a bachelors degree in Mechanical Engineering from Loughborough University, U.K., and have been involved in engineering and development in the field of metal containers for 23 years.
3. The Patent Application teaches and claims an easy opening can end including, among other things, a circular center panel having a diameter less than 1.835 inches and an opening that has both an open area of less than 0.5 in² and an aspect ratio of between 1.3 and 1.7.

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4. In an effort to improve the pouring properties of ends having a small center panel (that is, less than 1.835 inches), I discovered that an opening could provide improved pour characteristics when provided with an aspect ratio in a particular range, even though the opening was small in total area. That aspect ratio range is reflected in the pending claims of my Patent Application.
5. Prior to the time of my invention and discovery described in my Patent Application, typical, conventional thinking among engineers and designers working in the field of metal can end development was that an aspect ratio close to 1.0 (that is, a geometric shape approaching a circle) provided the best combination of open area and generally good flow parameters. Further, an aspect ratio greater than 1.1, which forms a slot-shape, was generally considered to be not preferred because of the inherent difficulties in drinking from a slot-shape opening -- including the fact that the pursed lips of some drinkers may not be wide enough to fully cover the slot, which could result in dribbling. Thus, the conventional thinking led away from an aspect ratio greater than 1.0 or 1.1.
6. I performed the testing that is represented in Exhibits 1 and 2 of the response to the Office Action submitted herewith. The testing demonstrates the unexpected flow characteristics of the opening described in my Patent Application by comparing the flow characteristics of conventional end C to those of my end -- embodiment end D having an aspect ratio falling within the range recited in my pending claim 1 but having an opening area equal to that of end C.
7. The opening described in my Patent Application provides fewer flow rate fluctuations than conventional aspect ratios for openings smaller than 0.5 in². In other words, the "glugging" phenomenon, which consumers consider unappealing, is reduced from the conventional end identified in Figure 3 of my Patent Application as end C.

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8. The opening described in my Patent Application not only provides a higher peak flow rate than conventional end C, but also reaches the peak flow rate significantly faster than does end C. The flow characteristic upon initially rotating the containers (as described on page 2, line 22, et. seq.), generally referred to as "inrush," is another important parameter. The flow rate of my end D stops monotonically increasing only at time increment 6 while conventional end C stops monotonically increasing at time increment 3. My end D delays detrimental glugging approximately for a period approximately twice as long as that for conventional end C. Further, my end D begins glugging at approximately the same time increment as conventional end A even though the opening of conventional end A is 32% larger than the opening of my end D (that is, 0.596 in^2 compared with 0.450 in^2).
9. The first local peak flow rate for my end D (measured at time increment 5) is 9.79 g/unit time, which is nearly double the first local peak flow rate of conventional end C, 4.92 g/unit time (measured at only time increment 2). The flow rate at the first local peak of my end D is even approximately 50 % larger than the second peak of conventional end C: 9.79 g/unit time compared with 6.53 g/unit time (both measured at time increment 5).
10. The total time required for emptying a container employing the opening described in my Patent Application is significantly shorter than for conventional end C. My end D emptied in 40 time increments, compared with 50 time increments for conventional end C having the same opening area.
11. The pouring characteristics of the opening described in my Patent Application even approach those of the larger, conventional end designated in Figure 3 of the Patent Application as end A, even though the opening of end A is approximately 22% larger than the opening of my end B (that is, 0.596 in^2 compared with 0.487 in^2) and 32% larger than the opening of my end D (that is, 0.596 in^2 compared with 0.450 in^2).

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12. The similarity of the plots of ends B and D in Exhibit 1 (that is, two embodiments of ends falling within my claimed aspect ratio range) demonstrate the advantages of the claimed range, as end B has an aspect ratio of 1.51 and end D has an aspect ratio of 1.61.
13. All statements of my own knowledge true and correct, or are based on information that I believe to be true and correct. I acknowledge that willful false statements and the like are punishable by fine or imprisonment, or both, and may jeopardize the validity of the application or any patent issuing thereon.

Executed on 9 December 2002,

Brian Fields
Brian Fields

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RELATED PROCEEDINGS APPENDIX

None.